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THE

## HARVEIAN ORATION.





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THE  
HARVEIAN ORATION,

DELIVERED AT

THE ROYAL COLLEGE OF PHYSICIANS, LONDON.

JUNE 29TH, 1867.

BY

JAMES ALDERSON, M.D., F.R.S.,

PRESIDENT OF THE COLLEGE.



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Scarcely less often have the most enlightened and distinguished of each passing generation been invited to assist at the annual commemoration, and adorn it by their presence; and I trust that I may be permitted on this occasion gratefully to acknowledge the response to this appeal.

I feel that it requires some apology if, for a moment, I postpone the especial topic of the day, in order to revert to certain peculiarities in the circumstances of the present occasion. I wish first to render my sincere thanks to our highly esteemed ex-President, for having done me the honour to appoint me Harveian Orator for this year. It is not possible to allude to him, without giving expression to the high sense we all entertain of the immense advantage enjoyed by this College and the whole profession in having been presided over by a man of such undisputed eminence; and I would not omit to add our cordial satisfaction that the sovereign has crowned with honour his laborious and successful career.

As regards the present unusual combina-

tion of the two offices of President and Harveian Orator, I must beg to explain that, at the time when I accepted the office of Orator, I could not be aware that the period of delivering the Oration would find me, by the flattering award of the Fellows, in the occupation of this chair. Having thus undertaken to deliver the Oration, it has been no small encouragement to me not to withdraw, that I am furnished with a distinguished precedent. That precedent I find in Sir Henry Halford; who, in the year 1835, converted the Oration into a Presidential Address. Sir Henry Halford's great ability and influence were sufficient to redeem any step that he could take from bearing the character of an innovation; and any act of his must be sufficient sanction for a proceeding which otherwise a man of less pretension might hesitate to venture on.

Thirteen years have passed since I last addressed you on an occasion like the present; but, though my subject was the same, I then addressed you in a different tongue. I do not speak of this as matter for regret. It

is but one of those thousand changes which are daily going on around us, and which we remark chiefly when they affect our own occupations.

*Debemur morti nos nostraque.*

And when we note in how many instances

The old order changes, giving place to new,

we need not shrink from Horace's conclusion,

*Nedum sermonis stet honos et gratia vivax.*

But I may be permitted to hope that those whom I have the honour of addressing will continue to welcome change only when it is synonymous with progress, and will not be the less zealous for ancient lore, because they have wisely discarded its use on public occasions like this.

But, if we thus depart from the literal terms of the endowment, it is all the more our duty to revert to the intention of the founder—to seize his spirit; and, by reflecting that spirit on the new and varying circumstances of the present day, thus to perpetuate

the original design. It may be, moreover, that we shall be able to strike out applications that could not have been anticipated in a bygone age. Let us do this with no presumptuous satisfaction in our modern superiority, but with due reverence to the past.

By the terms of the endowment, we are charged to deliver a solemn oration in honour of all those who have approved themselves benefactors of the College; we are to exhort others to imitate their liberality; and, in the quaint and admirable words of Harvey, "for the honour of the profession to continue mutually in love." A little band they were who first met to comply with this injunction—in number not exceeding twenty; but those were days when even the great royal foundation of St. Bartholomew's had but one physician—that physician being Harvey. How great has been the expansion of the profession is apparent from the fact that, instead of twenty, some two hundred and fifty Fellows, besides an immense body of members, might now take part in this commemoration.

If we refer once more to the terms of the foundation, we perceive that it is still our proper duty thankfully to bear in mind the more ancient of the benefactors, such as Linacre, Caius, Lord Lumley, and also Gulston : all these left property for foundations connected with the College. We will dwell on them only to bestow a brief tribute to the merit of Caius. Not only distinguished as one of the earliest Greek scholars, and as having given to the profession the first correct editions of Galen and Celsus, he was also the first to introduce and teach practical anatomy. It was he who began the Annals of the College, kept them in Latin, and set in order the finances. And his munificent re-endowment of Gonville Hall at Cambridge, was marked by especial reference to the faculty of medicine. It is a grateful task to vindicate the fame of a great man from the aspersions of intervening generations. Caius lived in a persecuting age, whilst mutual repression was still rampant between religious partisans, and whilst it was thought equally legitimate to resort to violence in the case of



heretics in science. At last, we have reached a time when happily we can afford to judge with fairness one who fell only into the error of his day. The generosity of Caius ought not to be obscured by the fault which belonged to all his compeers. Nor ought we to forget his loving act in raising that monument in old St. Paul's which once bore the inscription :—

“ Thomæ Linacro, clarissimo medico,  
Johannes Caius posuit Anno 1557.  
Vivat post funera virtus.”

The motto which Caius had inscribed to the honour of Linacre was afterwards adopted by whoever placed the stone over the remains of Caius, which is still to be seen, at the entrance into Caius College Chapel, with the brief addition, “ Fui Caius.”

I have alluded to those benefactors who preceded Harvey, because they must have been individually in his thoughts whilst he was framing his injunction.

On the subject of endowments generally, we perceive that, however rare they have become in modern times, they were then abun-

dant, and the cause which called for them is obvious. When Linacre obtained from Henry VIII. the first charter to incorporate this College of Physicians, the very existence of medicine as a separate calling was altogether new; for, until then, medicine had been studied in the cloister and practised almost exclusively in the murky den of the empiric, more sorcerer than professor of the healing art. The ancient literature of medicine had only just been brought to light by Linacre himself, at the epoch which we designate the revival of letters; and the stores of keen observation recorded by Hippocrates, Aretæus, and Galen, as well as by the Latin Celsus and the Arabian Rhazis, were new and rare helps to medical students. Yet the knowledge of those times could hardly be termed philosophy; and the practice, though displaying much acuteness, was no better than empirical.

When Harvey first entered the profession, though medical philosophy had made enormous progress, and though vigorous thinkers, not only in this country but in the schools of Italy, were already working at the important

problem which he was afterwards to solve, still physicians needed the support of incorporation; and they gladly welcomed funds and patronage to establish their existence as a learned body, claiming a status in society. Those who are familiar with the character of Harvey, who know how true and noble was his spirit, how simple were his habits, and how ardent was his devotion in the cause of science, cannot wonder that he should follow the example of his predecessors in still more generous measure. Let us then call to mind his own acts of liberality. In 1653, he presented to the college his valuable museum and library; he built a noble hall for the accommodation of the Fellows, and bequeathed in trust his patrimonial estate in Kent, the rent to be appropriated to the payment of a librarian, and to provide monthly collations, as well as an annual feast to be given at the time of the Oration. It was not left to the destructive work of time to sweep away the noble hall—that perished, with all its contents, in the great fire of 1666; but change in custom has rendered the collations obso-

lete, and the annual feast has been relinquished. We may presume to say, that this act of self-denial has not been altogether the fruit of our modern virtues of economy and temperance; we must confess rather that it has resulted from the difficult problem of how to regale the two hundred and fifty Fellows of the present day by means of funds provided for the then existing twenty. Let us, notwithstanding these inevitable changes, hope that the mutual incitement to study and goodwill may be observed for ages yet to come.

Although, as we have stated, the time has almost passed away for pecuniary aids to flow in other than strictly charitable channels, and, although medical science needs no longer liberal donations to attract or to support its votaries, yet it is my pleasing duty, on this occasion, to record an exception, and I have to acknowledge a fresh instance of the very sort of liberality which Harvey loved to encourage. We owe grateful thanks to Dr. Dyster of Tenby for presenting to the college 400*l.*, to be devoted to the presentation of a medal for the best essay on physiology—the foundation

being designed to do honour to the memory of his friend Dr. Baly. It has been determined that the medal shall be awarded biennially, and that it shall be entitled the Baly Medal.

As two anniversaries only have been celebrated since the college has decided on abandoning the classic form of delivery, it may seem not inappropriate to consider the legitimate matter of the annual address. The orators on these two anniversaries have used the occasion to dilate on special subjects, and they have done it gracefully and profitably. Yet, though their example may be occasionally adopted to great advantage, it may occur to some, as it does to me, that, by establishing that method as a rule, we should be in danger of losing sight of Harvey's meaning ; and that it would be more strictly in accordance with his wishes if we were to continue to commemorate the benefactors, and to make the progress and fresh achievements of medical science our prevailing theme. Both subjects can scarcely be completely handled in the time that an orator may reasonably command :

therefore, as I have alluded to some of Harvey's predecessors, I shall leave to future orators the ever-grateful theme of praise of those who followed him and imitated his generosity; whilst the present moment may be devoted to a short review of the existing state of science as it bears on our profession.

If we cast our thoughts back to the times of Harvey, we perceive that the study of medicine had already freed itself from a large portion of the ignorance and from nearly all the superstitious folly of the dark ages. The old cabalistic mysteries had disappeared; and astrology was beginning, but only beginning, to follow them as a delusion of the past. Frivolous tradition had altogether ceased to influence opinion as to the value of remedies and their proper mode of application; and, with the revival of letters, through which the system of Aristotle succeeded to the logic of the schoolmen, a legitimate course of philosophical study had decidedly set in. Natural facts were being sought out and accumulated; and rational deduction from these was opening out the way to a true, though, as yet,

partial insight into the nature of disease. The shades of ignorance, however, still gathered thickly over the subjects of pathology and therapeutics, whilst physiology was merely struggling into light.

It is a curious speculation to realize what the state of medical knowledge must have been whilst the circulating system remained still unrevealed. The depth of obscurity in which all the functions of the body during health, and all the morbid changes which constitute disease, must have been then involved, is by us now barely to be conceived. Yet we ought to estimate it fully in order to do justice to the amazing intelligence of those who, gifted with an almost prophetic mind, were able to perceive that, on the explanation of that great mystery, the whole future existence of medicine as a science hung suspended.

One undaunted pioneer on the road to this discovery had been cut off. The fate of poor Vesalius, wrecked and starved to death, always demands a passing word of sympathy. Had he lived, the progress of inquiry would



have been materially advanced ; but, by his untimely death, the work devolved upon our Harvey, and he had to labour all but destitute of assistance from collateral science.

If, on reviewing the relations which general science bore to physiology in Harvey's time, we contrast it with our own, how great we find the contrast. Then there was but one object, but one method, and but one chief worker : the indefatigable anatomising, the tracing of the intricate system of the vessels, the ecstatic contemplation of the wonderful contrivance of the valves, the close and accurate process of inductive reasoning—these were all his own ; but, whilst pushing onwards to his great victory, he was checked in his advance by want of aid from collateral science. Even the mode of depuration of the blood in its passage through the lungs could not but remain to him a mystery, because chemistry had to start to life before that process could be understood. Now, our fellow-workers are innumerable ; and every succeeding year brings with it speculations founded on treasures of new facts which we



can see and apply, by the light of our special knowledge, to explain disease or to essay remedial processes.

We must not seem to undervalue, though we pass quickly over, those modern sources of assistance afforded by microscopical examination or by those chemical discoveries which have explained many of the changes of the fluids of the body in a morbid state. These would have furnished revelations very surprising to the workers of the seventeenth century, and we cannot doubt that by the same means vast stores of knowledge will yet accrue to the students of the present and of succeeding times; but the intellect of this generation is pushing forward with still higher aim even to the discovery of the final law which governs morbid processes, which may by possibility reveal the nature and course of the action of remedies, and which will also explain the introduction and progressive spread of epidemics.

If we review the means which we have in hand to justify the belief that aims so lofty are not beyond our capacity to attain, nay,

that we may discern that they are actually within our reach, we may instance, first, the almost newly invented sciences of electricity and galvanism, and of meteorology emanating from these two ; all which bear especially on the last-named topic, viz., the nature and course of epidemics.

In this field of inquiry considerable vantage ground has already been established, and a luminous and succinct review of the present position of the question as to the true nature of light and electricity, has been drawn up by M. Saveney. He traces the course of investigation which has been pushed beyond the bare phenomenon of the electric spark, and of the appearances which that presents, even to the actual nature of the fluid of which the spark gives evidence.\*

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\* The old theory of two fluids has been combated with success. Those phenomena which supported the idea of two currents—viz., the beautiful feathered escape from the positive pole and the starred appearance displayed at the negative—have, by some curious experiments and apparently sound deductions, been shown to be deceptive ; and the starred appearance at the negative pole has been proved to be produced merely by recoil,

Collateral science is further aiding us to perceive that there is a different molecular arrangement in diaphanous or isolating bodies, as compared with opaque or conducting bodies, such as metals, etc. How far the new discoveries of Graham, which have demonstrated the presence of gases in metals and other substances held there by what he terms "occlusion," may throw light on this interesting and intricate subject, is as yet problematical; but I must add that the power, by means of heat, of making metals give up large volumes of these occluded gases, proves the existence of spaces between the molecules capable of

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and not to be the result of a second current in the opposite direction. Further, as a new demonstration, we may accept the statement that electricity is now understood to be an ethereal fluid, and not, like light and sound, to be a result of the mere vibration of a luminous ether, and that this fluid is propagated by layers. The evidence of electricity being a fluid, rests chiefly on the greatly increased intensity and condensation of power, developing more light and heat, when conducting wires are diminished in sectional area; as evidenced also in Geisler's tubes—the intensification following the natural law of fluids long since established.

being occupied by gases in a state of extraordinary condensation.

Even if we look on this merely as a matter of speculation not completely demonstrated, it is a new and intensely suggestive subject, though one on which I cannot enter more at large, having time neither to trace the progress of investigation, nor to review more minutely the results arrived at. I can only affirm that every year we seem more and more capable of entering into these subtle speculations; and though, as it is beautifully expressed by M. Saveney, these new views may be only *in penumbrâ*, yet we must rejoice that they have reached the half-light of demonstration, emerging from the darker shade of eclipse in which they have been hitherto obscured.

Glancing at the practical aspect of all these inquiries, we may say that meteorology, the full comprehension of which will obviously result from a complete understanding of the nature of light and electricity, is that science to which we are now looking for the law which regulates the transmission of disease.

Statistics, which furnish a method of inquiry wholly unknown in Harvey's time, supply us with evidence of the course of epidemics, of their successive appearance in each locality, and of the gradual increase and decline of the several visitations. These facts reveal an unerring course of geographical direction which is taken by disease; and it is already clear that the explanation of this observed course, and of the mode of propagation, is to be looked for in the diffusion and interchange of gases during the existence of epidemics. From whatever cause arising, we can at least speak of an unbalanced state of atmospheric electricity; whilst we must refer the effect to a *combination* of forces not as yet clearly made out. Our two great philosophers, Grove and Tyndall, are continually contributing fresh discoveries on this important topic, which promises such fertile results to aid in the pursuit of medical philosophy. We also owe a great deal to the labours of Graham; and it is not possible to glance even casually at this subject without acknowledging the debt which meteorological science

owes to the learned President of the Royal Society.

One obvious consequence of fuller demonstration of this difficult subject is, that we may hope to find in it a settlement of the long vexed question about contagion ; and that, together with that settlement, we may look for the abolition of many hurtful and of all needless regulations. Whilst no one disputes the evidence of many facts pointing to the theory of infection, no one, even in the present state of knowledge, can fail to perceive an *imperative* agent *guiding* the path of disease, and *dominating* both its progress and its degree of virulence. The final law, when once revealed, will of course reconcile all those apparent anomalies which are now perplexing to our partial knowledge. It will teach us better principles on which to work in our attempts to devise sanitary arrangements ; and, whilst we shall still rejoice that measures for purification, disinfection, cleanliness, and an adequate supply of pure water and wholesome food, are unremittingly adopted, we shall be spared those misgivings which



now disturb the minds of many as to the accuracy of the principles on which those admirable improvements are at present based.

It harmonises with the subject now before us, that I should congratulate our profession and the public on a new feature in the duties which we accept as belonging to our calling. Physicians have never been so impressed as of later years that the noblest of their avocations is to prevent or avert disease. They now perceive that this is at least as much their duty as to subdue or relieve the sufferings which attend it. It might, perhaps, be thought a humiliation, that our efforts seem to be less directed to curative measures, as compared with the energetic struggle to withstand the approaches of fatal epidemics; but we shall none of us disdain to acknowledge that the predominance of scientific aim does and ought to tend in this direction, though at the same time we strenuously deny that the therapeutic portion of our work is in abeyance. Whatever may carry to the great mass of our fellow-creatures the largest amount of comfort and relief must be our proper work;

and we delight to recognise in the labours of the physician a moral and æsthetic element improving the condition of the lower classes, as well as the general happiness of society. Knowing that in this branch, at least, there can be no disappointment and no deception, we hail with joy the wisdom and benevolence evinced, both by administrative power and by private charity, in cooperating with us.

I proceed now to inquire how far the present state of science affords us promise of success in our endeavours to elucidate those laws which govern the functions of the human frame in health, and cause the deterioration of those functions in disease.

Several new methods of investigation have been started in the last quarter of the century. Perhaps we may reckon as the most surprising and important those phenomena which have resulted from spectrum analysis. The application of this wholly new mode of inquiry to physiological topics has been forwarded by Professor Stokes, and by our energetic senior censor, Dr. Bence Jones.

There is another speculation still in pro-



gress, through which much new light may be hoped to be arrived at. Numerous lately ascertained facts point to the probability that a force is set up in the union or proximity of *different membranes and fluids*, resembling that which is admitted to take place in different metals under varying temperatures; and that this force may be the means of inducing what we call absorption and secretion. The very absorption of particular gases by metals and other substances, in the way of "occlusion" (to which I just now referred), seems to point to the existence of a certain *elective* power independent of a living principle. We may be asked, What is this but a further exemplification of chemical action? And as yet we are not in a position to give a definitive answer. But it is at least a field of inquiry which we welcome as new and very hopeful.

When we see a bit of leaf broken off, as we may in the plant *Vallisneria spiralis*, and are able to witness the movements of fluids within the minute cells following a precise and continuous course for hours after separation from the parent stem, all going on with-

out the assistance of any muscular heart to propel the fluid, we are led to believe that there must be some chemical (or perhaps, more properly speaking, *electrical*) power which guides the movement.

Leaving this, which is still a matter of speculation, I must, however, state that we are in possession of sufficient evidence in regard to what is called *osmotic* action to enable us to reason upon that remarkable property of membranes, and apply it both to physiology and pathology. Of all subjects, the law of transmission of liquids and gases through membranes (known to be, in the case of fluids at least, in some inverse ratio of their densities) is that which seems to promise the most immediate application to the actual nature of the forces in the living body.

As I have just hinted, the point at which our inquiries seem to halt in the vegetable circulation relates to the movement within the cell. It seems that the interchange of gases may be the result of a similar or identical force to that of osmotic action; and thus we have a glimpse at an universal oneness of

force, extending from that which influences the great atmospheric ocean to that which regulates the movements to be seen within the microscopic cell of organized life. This idea is partly analogous to a noble suggestion lately thrown out by a distinguished Fellow of this College. Dr. Odling, whilst demonstrating Mr. Graham's discovery of the existence of hydrogen in what some suppose to be sidereal or meteoric iron, compared that gas with other gases found in telluric iron; he then adverted to discoveries made through the new science of spectrum analysis, and showed by those discoveries the identity of the gases in the group of stars of which  $\alpha$  Lyræ is the type with the hydrogen in meteoric iron; and he then claimed from this identity an evidence of "one universal chemistry."

I trust that those of my audience who may be least familiar with the language of science will not fail to have perceived the intensity of the light which now dawns upon us, applicable as it is not only to a further discovery of the general laws of nature, but especially to those

of medical philosophy. They will, I hope, have seen how far that light may bear upon the subject of the propagation of epidemics, practically affecting all sanitary questions; how far, also, it encourages the hope of arriving eventually at the elucidation of all those functions of the human frame which remain but partially understood: how far, in short, it may disclose completely secrets which impede our perfect application of Harvey's own discovery of the circulation. In order that our aims should not seem to soar too high, or our hopes to exceed the moderation of sober-minded students, we like to seize occasions such as this to display our method of procedure, and to make known what the labour of the nineteenth-century physician really is.

It is not long since our ears were startled by the question, Is the medical a scientific profession?—a question as new as it is strange, and, I may be allowed to add, as insulting as it is new. Though we would not have mooted it, yet it does not misbecome us to reply. We say, then, Yes, emphatically yes. We are, indeed, of those

who are "looking into the mechanism of the world, and trying to find it out."\* Nay, the doubting sarcasm compels us to go further, and fearlessly assert that we are first amongst those seekers after an insight into God's works; for, inasmuch as the human frame is the climax of creative power, and inasmuch as all knowledge in every branch of science must be mastered before the meanest of its parts or the simplest of its functions can be duly comprehended, so do we claim to have the greatest and the noblest of subjects for our particular study. We must be not only versed in some special branch of philosophy, but we must be able to take a comprehensive view of all established truths, to concentrate them in one focus, and throw their combined light upon our work. And, whilst we thus repel the incredulity of those without, let me be allowed one hint to those within our pale, and give utterance to the conviction that no man can be a good or in any sense a real physician, who fails in hopefulness of the coming triumphs of medical

\* Rev. F. D. Maurice.

investigation, or who lacks faith in the power of his art.

And not only should we feel the urgent need of apprehending all truths divulged by collateral science, but it is our interest, as well as our duty, to promote the diffusion of medical knowledge throughout society ; for we may thereby hope to mitigate the greatest of our trials. It is peculiar to us, that we are judged by those who are not able to form just opinions. A cause won by a great lawyer is appreciated by all ; but a life saved, or a true judgment pronounced in an obscure but hopelessly fatal case, may be attributed to anything except the physician's skill and knowledge. The public need much scientific enlightenment fairly to estimate the results of practice, or to decide on the merits of any new discoveries. Harvey lost much of his popularity by promulgating his views ; and society is scarcely more able now than in the time of Harvey to decide justly whether they are crushing a meritorious practitioner by their censure, or bolstering up a quack by their encomiums. This uncertainty of re-

ceiving an intelligent award is a harder grievance than the absence in our profession of those rich prizes which are meted out so liberally to the successful in the sister faculties of Divinity and Law.

This allusion to the name of Harvey warns me once more to revert to the duty of the day, and suggests that I have scarcely borne the meed of honour due to his great memory. It was more than talent, more than devoted industry, which were needed to make up the complement of noble qualities by which a fame like his could rise and live. Modest, courageous, temperate, generous and courteous—a brilliant catalogue of virtues!—these were his ; and genial circumstances attended his career. Obstructions and neglect, we know, crossed him. When has the path of human life been trodden without meeting them ? Yet, as regards his scientific labours, it may be questioned whether difficulties in the establishment of any new-found truth ought to be esteemed a hardship. New knowledge must be proved ; and a too facile acceptation can be wished for only by pro-



mulgators of error. Harvey, no doubt, felt this ; and, with his own peculiar patience, he waited for the triumph, and it came. His great discovery was fully accepted by his own generation ; he was almost idolised by his profession ; he was patronised by his sovereign ; and he closed a long life cherished and revered by all.

If we take a brief review of the progress of English intellect during the last few centuries, and note the leading characteristic of each succeeding period, we may trace three especial epochs : first, that of English literature, which was in its zenith when our profession assumed a position in the scientific world.

Real medical science struggled feebly onward during that literary epoch ; but when Shakspeare's sun set, and Harvey's rose, the true scientific age of England began to dawn. Harvey and Newton unveiled a galaxy of light, in an epoch of single but most significant discoveries.

After another century or more, during which science remained all but stationary, the chief workers rather reviewing the



ground obtained, than materially advancing,—we of this nineteenth century find ourselves in another scientific epoch, and we are in the midst of labours extended in innumerable directions, in a measure that could not have entered into the imaginations of the earlier philosophers.

It is possible that future generations may not attribute to our age any one gigantic revelation, such as those which we owe to Harvey and to Newton; but a vista is opening which discloses the almost certain prospect that the results of inquiries now being pushed forward with so much vigour will concentrate in the discovery of some single comprehensive law, and that that law will be applicable to all that is now mysterious in the organic system of creation. As, in the former scientific period, the labourers were few and the topics of investigation limited, now, on the contrary, the labourers are many and the subjects diverse. In every department, the progress of one is applicable to the researches of the other; all are on the same track—all verging to one common end.

Thus a series of thinkers and workers continually succeed one another, each in his turn throwing light on the mysteries of our living frame—

*Et quasi cursores vitæ lampada tradunt.*

In this, however, they are happily so far unlike the runners in the ancient torch-race, that the light of science which they pass onward is no flickering blaze, threatening instant extinction, and at best soon to die in other hands, but a self-renewing flame, which finds its own fuel as it advances, and becomes more brilliant by transmission.